Doc Code: AP.PRE.REQ

PTO/SB/33 (07-05)
Approved for use through 06/30/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on ______________________________

Signature______________________________

Typed or printed name ______________________________

Application Number	Filed

First Named Inventor

Art Unit	Examiner

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☐ attorney or agent of record.
Registration number ______________________________.

☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 ______________

____
Signature

____
Typed or printed name

____
Telephone number

____
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ________ forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Daniel Watson

Serial Number: 10/783,933

Filed: February 20, 2004

Entitled: THERMALLY TREATED POLYCRYSTALLINE DIAMOND (PCD) AND POLYCRYSTALLINE DIAMOND COMPACT (PDC) MATERIAL

Confirmation Number: 7269

Examiner: HENDRICKSON, Stuart L.

Group Art Unit: 1793

Attorney Docket Number: 1157.008

MAIL STOP AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REASONS UPON WHICH REVIEW IS REQUESTED

Applicant has filed a notice of appeal, and is requesting pre-appeal brief review. Applicant believes that the 35 USC §103(a) rejection of Claim 1 of the present application as unpatentable over *Lundin et al.* (5,103,701) taken with *Li et al.* (6,609,963) is improper. Applicant further believes that the 35 USC §103(a) rejection of Claim 1 as unpatentable over *Fang* (6,319,460) is improper. Applicant additionally believes that the 35 USC §102(b), or alternatively, §103(a) rejection of Claim 1 as anticipated or obvious over *Villela-Jirau* (6,030,596) is improper.

Applicant filed an amendment and response on January 21, 2008, to teach a toughened material that comprises a polycrystalline diamond material integrated with a second material, wherein the second material comprises a substantially continuous matrix in which granules of the polycrystalline diamond material are dispersed, and wherein the second material has a degree of ductility that is greater than that of the granules of the polycrystalline diamond material dispersed within the substantially continuous matrix.

Applicant's Claim 1 teaches a toughened material comprising a polycrystalline diamond material integrated with a second material, which can include iron, iron alloys, copper, copper alloys, a carbide, a ceramet, or combinations thereof. (Paragraph [00032]) The second material comprises a substantially continuous matrix in which granules of the polycrystalline diamond are dispersed, the second material having a degree of ductility greater than that of the granules of the polycrystalline diamond material. (Paragraph [00015])

The toughened material is formed by a process that includes subjecting the polycrystalline diamond material to multiple alternating cryogenic and heated tempering cycles, using specified target temperatures and controlled temperature rates of change. (Paragraph [0007])

The resulting toughened material has improved structural and material characteristics that include increased strength and toughness, and lowered brittleness. (Paragraphs [00027] and [0004]) The enhanced structural and material characteristics are obtained through use of the alternating cryogenic and heated tempering cycles, using temperatures and temperature rates of change that avoid over-stressing the polycrystalline diamond material or causing fractures. (Paragraphs [00021] and [00024])

Lundin et al. describe an apparatus for machining metals that detrimentally react with diamond cutting tools, in which the workpiece and diamond cutting tools are chilled to reduce wear on the diamond cutting tools. (*Lundin et al.*, Abstract)

Lundin et al. do not describe an unstressed toughened diamond material without fractures that possesses improved structural and material characteristics, which Applicant obtains by subjecting a polycrystalline diamond material integrated with a second material to alternating cryogenic and thermal tempering cycles.

Lundin et al. do not teach a second material having a substantially continuous matrix in which granules of the polycrystalline diamond material are dispersed, nor do *Lundin et al.* teach the second material having a degree of ductility greater than that of the granules of polycrystalline diamond material.

Lu*ndin et al.* teach only chilling a diamond tipped cutting tool and do not describe the components of the tool or improved structural characteristics resulting from the chilling.

Li et al. describe an abrasive tool that includes a superabrasive grain component, a filler component, and a vitreous bond component. (*Li*, Column 1, Lines 35-55) The abrasive tool is useable to grind polycrystalline diamond tools. (*Li*, Column 5, Lines 47-55)

Li et al. fail to teach an unstressed toughened diamond material without fractures that possesses improved structural and material characteristics, which Applicant obtains by subjecting a polycrystalline diamond material integrated with a second material to alternating cryogenic and thermal tempering cycles.

Li et al. also do not teach a second material having a substantially continuous matrix in which granules of the polycrystalline diamond material are dispersed, wherein the second material has a degree of ductility greater than that of the granules of polycrystalline diamond material.

Fang describes a super-hard composite material that includes a super-hard component and a metal matrix component, that has been compacted to an actual density of at least 95% of the theoretical maximum density of the mixture. (*Fang*, Column 2, Lines 48-57) *Fang* describes that materials such as diamond or cubic boron nitride are distributed in the metal matrix, and that the super-hard composite has a higher toughness and reduced wear resistance versus similar composites. (*Fang*, Column 3, Lines 9-16)

Fang fails to teach an unstressed toughened diamond material without fractures that possesses improved structural and material characteristics, obtained by subjecting a polycrystalline diamond material integrated with a second material to alternating cryogenic and thermal tempering cycles.

Fang instead teaches a diamond or cubic boron nitrate – metal matrix compound that has high fracture toughness, achieved through compacting super-hard component with a metal matrix component. *Fang* does not teach the additional properties of decreased brittleness or a lack of fractures caused by stress from the creation process, which Applicant's toughened material exhibits due to the use of specified target temperatures and controlled temperature rates of change.

Villea-Jirau describes a method for synthesizing diamonds from carbon using copper as a solvent. (*Villea-Jirau*, Column 1, Lines 10-15) Under a pressure of up to

100,000 psi, while heating to 700-720 degrees Centigrade, the carbon crystallizes into the copper. (*Villa-Jirau*, Column 1, Lines 50-56 and Column 2, Lines 46-51)

Villea-Jirau fails to teach an unstressed toughened diamond material without fractures that possesses improved structural and material characteristics, which Applicant obtains by subjecting a polycrystalline diamond material integrated with a second material to alternating cryogenic and thermal tempering cycles. *Villea-Jirau* teaches only the synthesis of a diamond, using high pressure and a copper-based solvent.

Applicant's use of alternating cryogenic and thermal tempering cycles prevents stressing or fracturing of the diamond material, which can occur under high pressure, or through use of heating cycles alone. Further, Applicant's specified target temperatures and controlled temperature rates of change result in the formation of a toughened material with improved structural characteristics.

The art of record fails to teach a toughened material with improved structural characteristics, as taught by Applicant.

Applicant therefore believes that Claim 1 teaches past the art of record and is in condition for allowance, and such allowance is respectfully requested.

Reconsideration of this application in light of the above arguments is respectfully requested.

Respectfully submitted,

Wendy Buskop

Date: June 17, 2008

Wendy Buskop
Reg. No. 32,202

Please mail correspondence to:

The address associated with **CUSTOMER NO. 29637**

BUSKOP LAW GROUP, PC
4511 DACOMA STREET
HOUSTON, TEXAS 77092
(TEL)713-403-7411
(FAX)713-275-3419